Docket No.:

005918 USA/FPS/MMCS/APC

PATENT/OFFICIAL

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Application of

HANMUGASUNDRAM et al.

Serial No. 09/943,955

Group Art Unit: 1765

Filed: August 31, 2001

Examiner: Lynette T. Umez Eronini

For:

FEEDBACK CONTROL OF A CHEMICAL MECHANICAL POLISHING DEVICE

PROVIDING MANIPULATION OF REMOVAL RATE PROFILES

## SUPPLEMENTAL INFORMATION DISCLOSURE STATEMENT

Honorable Commissioner for Patents P.O. Box 1450 Alexandria, VA 22313-1450

Sir:

In accordance with the provisions of 37 C.F.R. 1.56, 1.97 and 1.98, the attention of the Patent and Trademark Office is hereby directed to the documents listed on the attached form PTO-1449. It is respectfully requested that the documents be expressly considered during the prosecution of this application, and that the documents be made of record therein and appear among the "References Cited" on any patent to issue therefrom.

This submission does not constitute a representation that a search has been made or that no better art exists and does not constitute an admission or representation that any of the listed documents is material or constitutes prior art. If it should be determined that any of the listed documents does not constitute prior art under the United States law, Applicants reserve the right

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## Serial No. 09/943,955

to present to the Office the relevant facts and law regarding the appropriate status of such document.

Please charge the fee of \$180.00 under 37 CFR 1.17(p) to Deposit Account No. 08-0219. The Commissioner is hereby authorized to charge any additional fees that may be required for this submission, or credit any overpayment to deposit account no. 08-0219.

Respectfully submitted,

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## INFORMATION DISCLOSURE CITATION IN AN APPLICATION (PTO-1449)

ATTY. DOCKET NO. 005918 USA/ FPS/MMCS/APC SERIAL NO. 09/943,955

APPLICANT

SHANMUGASUNDRAM et al.

FILING DATE August 31, 2001 GROUP 1765

## U.S. PATENT DOCUMENTS

EXAMINER'S INITIALS	PATENT NO.	DATE	NAME	CLASS	SUBCLASS	FILING DATE
	4,957,605	09/18/90	Hurwitt et al.		00002.100	04/17/89
	5,369,544	11/29/94	Mastrangelo			04/05/93
	5,444,837	08/22/95	Bomans et al.			12/29/93
	5,665,214	09/09/97	Iturralde			05/03/95
, <u></u>	5,695,810	12/09/97	Dubin et al.			11/20/96
	5,824,599	10/20/98	Schacham-Diamand et al.			01/16/96
	5,825,356	10/20/98	Habib et al.			03/18/96
	5,831,851	11/03/98	Eastburn et al.			03/21/95
	5,838,951	11/17/98	Song			08/28/96
	5,859,777	01/12/99	Yokoyama et al.			05/13/97
	5,871,805	02/16/99	Lemelson			04/08/96
	5,943,550	08/24/99	Fulford, Jr. et al.			03/29/96
	6,012,048	01/04/00	Gustin et al.			05/30/97
. ,,	6,037,664	03/14/00	Zhao et al.			03/31/98
	6,059,636	05/09/00	Inaba et al.			07/09/98
	6,096,649	08/01/00	Jang			10/25/99
	6,100,195	08/08/00	Chan et al.			12/28/98
	6,114,238	09/05/00	Liao	-		05/20/98
	6,150,270	11/21/00	Matsuda et al.			01/07/99
	6,157,864	12/05/00	Schwenke et al.			05/08/98
	6,181,013 B1	01/30/01	Liu et al.			03/13/00
	6,212,961 B1	04/10/01	Dvir		-,	02/11/99
	6,226,563 B1	05/01/01	Lim			09/04/98
	6,237,050 B1	05/22/01	Kim et al.			09/04/98
	2001/0006873 A1	07/05/01	Moore			02/13/01
	6,259,160 B1	07/10/01	Lopatin et al.			04/21/99
	6,281,127 B1	08/28/01	Shue			04/15/99

INFORMATION DISCLOSURE CITATION IN AN				ATTY. DOCKET NO. 005918 USA/ FPS/MMCS/APC		SERIAL NO. 09/943,955	
OIP	APPLIC.	ATION					
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				SHANMUGASUN	IDRAM e	et al.	
RADEMARKOW PRADEMARKOW				FILING DATE		GROUP	
				August 31, 2001		1765	
		τ	I.S. PATENT DO	CUMENTS			
EXAMINER'S INITIALS	PATENT NO.	DATE	N	IAME	CLASS	SUBCLASS	FILING DATE
	6,317,643 B1	11/13/01	Dmochowski				03/31/99
	6,339,727 B1	01/15/02	Ladd				12/21/98
	6,355,559 B1	03/12/02	Havemann et al	•			11/03/00
	6,391,780 B1	05/21/02	Shih et al.				08/23/99
	6,417,014 B1	07/09/02	Lam et al.				10/19/99
	6,427,093 B1	07/30/02	Toprac				10/07/99
	6,449,524 B1	09/10/02	Miller et al.				01/04/00
	6,455,415 B1	09/24/02	Lopatin et al.		· · · · · · · · · · · · · · · · · · ·		04/16/01
	2002/0165636 A1	11/07/02	Hasan				04/24/02
	6,484,064 B1	11/19/02	Campbell			<u> </u>	10/05/99
_	6,495,452 B1	12/17/02	Shih				08/18/99
	2002/0193899 A1	12/19/02	Shanmugasundr	am et al.			05/01/02
	2003/0017256 A1	01/23/03	Shimane				06/12/02
	6,515,368 B1	02/04/03	Lopatin et al.				12/07/01
	6,517,414 B1	02/11/03	Tobin et al.				03/10/00
	6,528,409 B1	03/04/03	Lopatin et al.				04/29/02
	6,537,912 B1	03/25/03	Agarwal			<u> </u>	08/25/00
	6,580,958 B1	06/17/03	Takano				11/22/99
	6,605,549 B2	08/12/03	Leu et al.				09/29/01
	6,607,976 B2	08/19/03	Chen et al.				09/25/01
	6,616,513 B1	09/09/03	Osterheld				04/05/01
	6,624,075 B1	09/23/03	Lopatin et al.				11/05/02
	6,630,741 B1	10/07/03	Lopatin et al.				12/07/01
	6,660,633 B1	12/09/03	Lopatin et al.				02/26/02
	6,708,074 B1	03/16/04	Chi et al.				08/11/00
	6,708,075 B2	03/16/04	Sonderman et al				11/16/01
	6,728,587 B2	04/27/04	Goldman et al.				12/27/00
EXAMINER	·	·	DA	TE CONSIDERED			·

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INFORMATION DISCLOSURE				ATTY. DOCKET NO.		SERIAL NO.		
CITATION IN AN				005918 USA/ FPS/MMCS/APC		09/943,955		
APPLICATION				FPS/MMCS/APC				
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	' من (PTO-1	(449)						
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AUG 112	<sup>1004</sup> 岁			SHANMUGASUI	NDRAM 6	et al.		
\ <u>F</u>	. <b>&amp;</b> /			FILING DATE		GROUP		
FOREIGN PATENT				August 31, 2001		1765		
		FOR	EIGN PATENT	DOCUMENTS				-
EXAMINER'S		1	T		<u> </u>	T	Translation	
INITIALS			co	UNTRY CLASS		SUBCLASS		·
							Yes	No
	EP 0 932 195 A1	07/28/99	EP				X	
	EP 1 083 470 A2	03/14/01	EP				X	
	GB 2 365 215 A	02/13/02	GB	- <u> </u>			X	
	OTHE	R ART (Inclu	ding Author, Ti	tle, Date, Pertinent	Pages, Etc	e.)		1
							zation.'	,
	Sun, S.C. 1998. "CVD and PVD Transition Metal Nitrides as Diffusion Barriers for Cu Metallization." <i>IEEE</i> . pp. 243-246.							
	Tagami, M., A. Furuya, T. Onodera, and Y. Hayashi. 1999. "Layered Ta-nitrides (LTN) Barrier Film by							
	Power Swing Sputtering (PSS) Technique for MOCVD-Cu Damascene Interconnects." <i>IEEE</i> . pp. 635-638.							
	Yamagishi, H., Z. Tokei, G.P. Beyer, R. Donaton, H. Bender, T. Nogami, and K. Maex. 2000. "TEM/SEM							
	Investigation and Electrical Evaluation of a Bottomless I-PVD TA(N) Barrier in Dual Damascene" (Abstract). Advanced Metallization Conference 2000. San Diego, CA.							
	Eisenbraun, Eric, Oscar van der Straten, Yu Zhu, Katharine Dovidenko, and Alain Kaloyeros. 2001.							
	"Atomic Layer Deposition (ALD) of Tantalum-Based Materials for Zero Thickness Copper Barrier							
	Applications" (Abstract). IEEE. pp. 207-209.							
	Smith, S.R., K.E. Elers, T. Jacobs, V. Blaschke, and K. Pfeifer. 2001. "Physical and Electrical							
				ffusion Barrier in 0.25 mum, Dual Damascene Backend				
	Structures" (Abstract). Advanced Metallization Conference 2001. Montreal, Quebec.  Kim, Y.T. and H. Sim. 2002. "Characteristics of Pulse Plasma Enhanced Atomic Layer Deposition of							
	Tungsten Nitride Diffusion Barrier for Copper Interconnect" (Abstract). <i>IEIC Technical Report</i> . Vol. 102,							
	No. 178, pp. 115-118.							
	Elers, Kai-Erik, Ville Saanila, Pekka J. Soininen, Wei-Min Li, Juhana T. Kostamo, Suvi Haukka, Jyrki							
	Juhanoja, and Wim F.A. Besling. 2002. "Diffusion Barrier Deposition on a Copper Surface by Atomic							
	Layer Deposition" (Abstract). Advanced Materials. Vol. 14, No. 13-14, pp. 149-153.							
	Peng, C.H., C.H. Hsieh, C.L. Huang, J.C. Lin, M.H. Tsai, M.W. Lin, C.L. Chang, Winston S. Shue, and M.S. Liang. 2002. "A 90nm Generation Copper Dual Damascene Technology with ALD TaN Barrier." <i>IEEE</i> .							
	pp. 603-606.							
	Van der Straten, O., Y. Zhu, E. Eisenbraun, and A. Kaloyeros. 2002. "Thermal and Electrical Barrier							
	Performance Testing of Ultrathin Atomic Layer Deposition Tantalum-Based Materials for Nanoscale Copper							
	Metallization." IEEE. pp. 188-190.							
	Wu, Z.C., Y.C. Lu, C.C. Chiang, M.C. Chen, B.T. Chen, G.J. Wang, Y.T. Chen, J.L. Huang, S.M. Jang, and							
	M.S. Liang. 2002. "Advanced Metal Barrier Free Cu Damascene Interconnects with PECVD Silicon Carbide Barriers for 90/65-nm BEOL Technology." <i>IEEE</i> . pp. 595-598.							
	July 25, 2003. International Search Report for PCT/US02/24858.							
	March 30, 2004. Written Opinion for PCT/US02/19062.							
	April 22, 2004. Written Opinion for PCT/US02/19116.							
	April 22, 2004. Office Action for U.S. Serial No. 09/998,372, filed November 30, 2001.							
EXAMINER			DA	ATE CONSIDERED				

INFORMATION DISCLOSURI CITATION IN AN	E ATTY. DOCKET NO. 005918 USA/ FPS/MMCS/APC	SERIAL NO. 09/943,955
APPLICATION (PTO-1449)		
	APPLICANT SHANMUGASUNDRA	M et al.
Alfo 1 1 2004 g	FILING DATE August 31, 2001	GROUP 1765
OTHER ART (Including A	Author, Title, Date, Pertinent Pages	s, Etc.)
April 28, 2004. Written Opinion for PC	CT/US02/19117.	
April 29, 2004. Written Opinion for PC	CT/US02/19061.	
May 5, 2004. International Preliminary	Examination Report for PCT/US01/2	27406.
May 28, 2004. Office Action for U.S. S	Serial No. 09/943,383, filed August 3	1, 2001.
June 3, 2004. Office Action for U.S. Se		
June 23, 2004. Office Action for U.S. S		
June 30, 2004. Office Action for U.S. S		
July 12, 2004. Office Action for U.S. So	erial No. 10/173,108, filed June 8, 20	002.
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